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SHORT COMMUNICATION

Number, density and distribution of Rufous-banded Owl *Ciccaba albitarsis* (Strigiformes, Strigidae) in a cloud forest

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Abstract

The aim of the research was to determine the number and distribution of the Rufous-banded Owls *Ciccaba albitarsis* in a cloud forest on the northern slopes of the Andes. The study was performed using the territory mapping technique and a GPS device in an area of 7 km^2. The number of territories was estimated at 40, resulting in a density of 5.7 territories/km^2. To the best of our knowledge, this is the first published data on density of the Rufous-banded Owl in a cloud forest. The population density of the species in our study area corresponds with the densities of the other similar owl species in the Tropics.

Keywords

Andes, breeding density, cloud forest, owls, Rufous-banded Owl, Strigidae

Introduction

The Rufous-banded Owl (*Ciccaba albitarsis* Bonaparte, 1850) is a monotypic, poorly-known Andean owl species (total length 30–36 cm), with a rather wide geographic range, ranging from northern Venezuela to western and central Bolivia and predominantly found at elevations of 1700–3700 m a.s.l. (Ridgely and Greenfield 2001).

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PENSOFT

It is one of four species of the genus *Ciccaba*, formerly included in the genus *Strix* (Holt et al. 2020). The Rufous-banded Owl is an uncommon to locally fairly common species in Ecuador, recorded mostly between 1700 and 3700 m a.s.l. (Mikkola 2012). This nocturnal bird inhabits cloud forests with lush vegetation with dense undergrowth, epiphytes and mosses (König et al. 1999; Mikkola 2012). There are only infrequent data on its nesting sites or breeding biology (Greeney 2003; König et al. 2008). Despite the sparse information about this species, it is classified as Least Concern (LC), mainly because of its wide range (BirdLife International 2018).

The main diet of this species includes invertebrates and small mammals (Restrepo-Cardona et al. 2018; Holt et al. 2020). The three pellets which were found near Yanayacu Biological Station in north-eastern Ecuador included the remains of a small mammal and large Coleopterans (Greeney 2003). This is a sexually monomorphic species; however, males and females produce different sex-specific vocalisations. The closely-related species, the Black-banded Owl *Ciccaba huhula*, inhabits lowlands up to the height of 1400 m a. s. l. (Holt et al. 2020). One or two individuals of an unknown species of owls ("San Isidro Owl") are constantly observed near Yanayacu Biological Station. The identity of the species is not clear and some researchers state that this mysterious owl is *Ciccaba huhula* (Holt et al. 2020). To date, number, distribution and density of owls breeding in primeval mountain forests in the Andes have not been studied sufficiently. Due to their secretive behaviour and nocturnal activity, we have poor knowledge of the density of owls.

The aim of the research was to determine the population and distribution of the Rufous-banded Owl in a cloud forest. Although owls are of significant conservation concern, key aspects of their ecology remain poorly understood. Knowing their numbers and ecological requirements in the breeding areas is very important for the development of an effective conservation strategy for areas holding populations of this species.

Materials and methods

The study was carried out on a 7 km^2 plot in a cloud forest (mostly primeval) between Yanayacu Biological Station (00°36'S, 77°53'W) and the village Cosanga, at an altitude of 2000–2250 m a.s.l. (Napo Province, north-eastern Ecuador; for a more complete area description, see Valencia 1995). Bird censuses were carried out with the territory mapping technique (Bibby et al. 2000), without imitating territorial call of owls. During each survey, the observer moved along paths using GPS for self-location and mapping of individuals (mainly males). We sexed birds on the basis of owl calls obtained from the webpage xeno-canto (Xeno-canto Foundation 2019). The recordings on that webpage had been registered at the altitudes between 1600 (Ecuador) and 3900 m a. s. l. (Peru).

We carried out the field study between 1 November and 24 December of 2009. During the whole study period, the fifteen owl counts were carried out during rainless and windless nights. Due to the spontaneous voice activity of owls being high, we did not use playback. Each count lasted for about 5 hours. Counts took place on 9, 19, 26, 27 and 28 November and 1, 3, 4, 5, 7, 8, 10, 11, 17 and 24 December 2009.

The position of the bird was marked on a map and the exact coordinates were entered on a GPS receiver. The birds' movements and territorial behaviour were recorded on a map. During mapping, special attention was paid to simultaneously calling males and pair members. The number of territories was calculated, based mainly on simultaneously calling birds (mostly males, but in some cases duetting pairs) to avoid over-estimation of the number of individuals and territories. In four cases, we classified as breeding territories the localities where only one calling bird was heard. However, in all these cases, calling males were recorded during 2–3 counts in places located more than 300 m from other breeding territories with calling individuals. The call of the Rufous-banded Owl is quite distinctive and unmistakable in comparison to calls of other owls. During the counts, we did not record the voices that would be different from typical vocalisation for *C. albitarsis* (e.g. xeno-canto.org/337976), hence wrong identification of calls of other owl species was very unlikely.

Results and discussion

In November and December 2009, we observed high vocal activity, territorial aggression and signalling of the Rufous-banded Owls. The intense calling of males in the study area started on 9 November and we did not note any calls during ten preceding nights. We estimated that the surveyed area hosted 40 territories of the Rufous-banded Owl and hence the species density was 5.7 territories/km^2. During the study period, we did not record any other owl species in the study area. The territories of the Rufous-banded Owl were not evenly distributed (Fig. 1). We detected mostly calling males, but we also found seven females and five calling pairs. The average distance between calling birds was 288 m (median = 250 m; range 65–850 m; n = 46).

There is no information on population densities of north Andean owls. To the best of our knowledge, this is the first report of number, density and distribution of the Rufous-banded Owl in a cloud forest. Similar densities were reported for some other tropical owls of a similar size. Borges et al. (2004) conducted a study on the density and habitat use of some owl species in Central Amazonian terra-firma and black-water flooded forests. One of the most abundant species was the Spectacled Owl *Pulsatrix perspicillata* (size 43–52 cm) – 31 individuals/1 km^2. Seven breeding adults per km^2 of Mottled Owls *Ciccaba virgata* (size 29–38 cm) were reported in a primeval forest in Guatemala (Gerhardt et al. 1994). Christmas Island Hawk Owl *Ninox natalis* (size 26–29 cm) in primary forest occupied essentially exclusive territories with the average density of 5.5 individual territories per km^2 (Hill and Lill 1998). Barn Owls *Tyto alba* were counted with playback on one of the Comoro Archipelago islands (Mayotte) and the breeding densities were estimated at ca. 1.0–2.8 territories/km^2 (Stevens et al. 1999).

The breeding season of tropical owl species is generally significantly extended and may last for most of the year. However, in areas with distinct wet and dry seasons, the breeding season usually coincides with the dry season or occurs at its end (Marks et al. 1999). The pattern of breeding phenology of the Rufous-banded Owl is

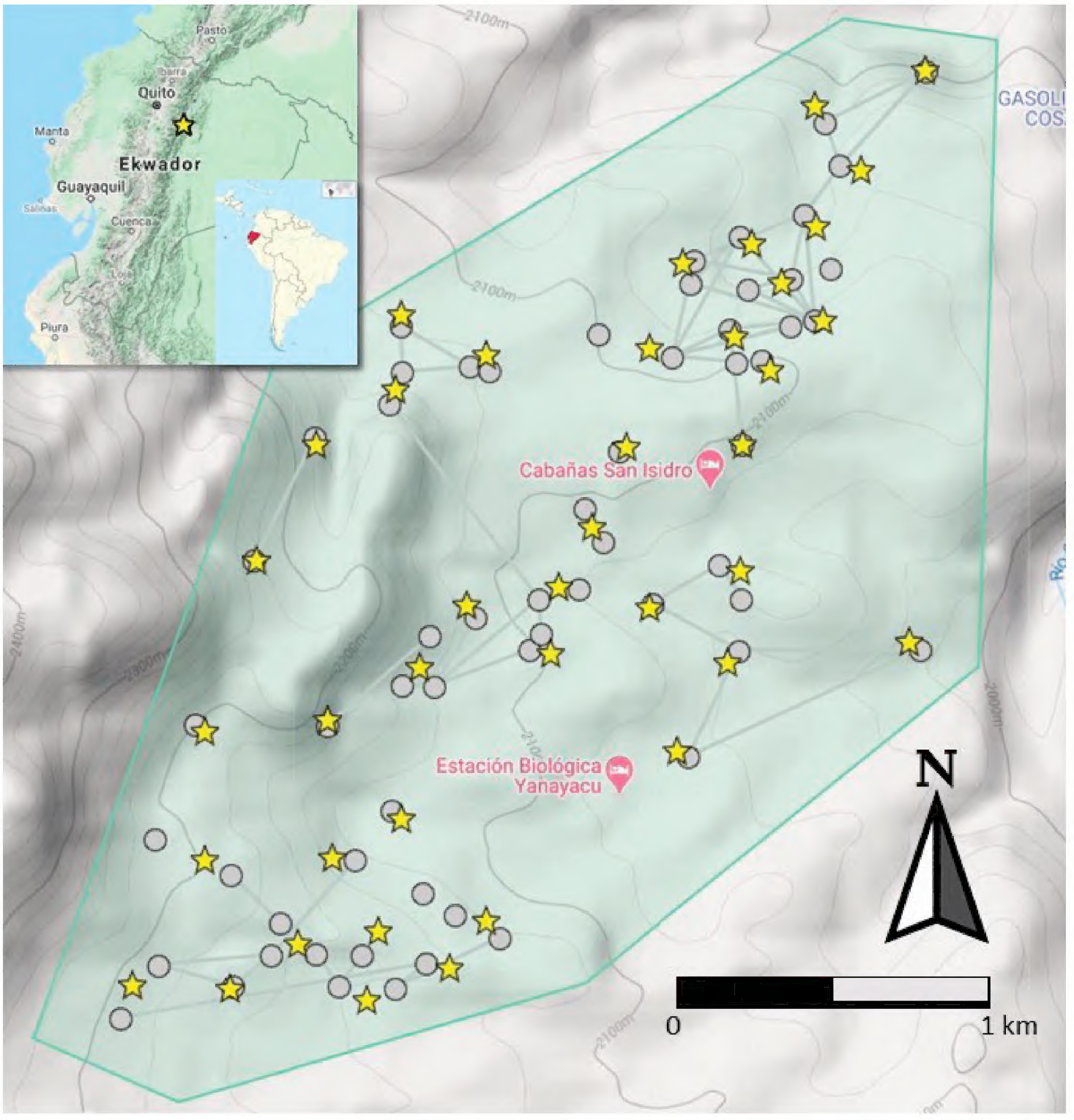

Figure 1. Distribution of calling males of the Rufous-banded Owls and their territories in the study area located in the Napo Province, north-eastern Ecuador. Stars – territory centre, grey circles – calling males, grey line – line connect calling males at the same time, green line – study area. Map data 2019 (C) Google.

poorly known. However, fledged young were found on 13 January (Greeney 2003) and in October (dry season) (Greeney 2003). According to Greeney (2003), this may indicate that the species nests throughout the whole year or breeds opportunistically at the time of food abundance. In Colombia, the young of the species were recorded at the end of January (Hilty and Brown 1986), 22 July (König et al. 1999), 19 March (Jaramillo 2019) and 18 April (Uribe 2015). URL Internet Bird Collection and xeno-canto provides evidence that males of the species call throughout the whole year (n = 50) and the lowest number of records comes from June and August (however, the data were collected occasionally and not within a standard research programme).

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